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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,094	12/27/2001	Sekharipuram R. Narayanan	06816-044003	2464
20985	7590	12/01/2005	EXAMINER	
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			TSANG FOSTER, SUSY N	
			ART UNIT	PAPER NUMBER

1745

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/034,094	Applicant(s) NARAYANAN ET AL.	
	Examiner Susy N. Tsang-Foster	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 7-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/12/2005 has been entered.

### ***Response to Amendment***

2. This Office Action is responsive to the amendment filed on 9/12/2005. Claims 1 and 26 have been amended. Claims 1-26 are pending. Claims 7-25 are withdrawn from further consideration as being directed to nonelected species. Claims 1-6, and 26 are rejected for reasons given below.

### ***Specification***

3. The amendment filed 9/12/2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

In paragraph 69 on page 18, starting at line 16, adding the phrase "into the catalyst material" in the first sentence constitutes new matter. Also in paragraph 69, adding the phrase "can also be used as the substance insoluble in the catalyst material" constitutes new matter.

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The original specification at paragraph 69 is limited to temporary introduction of a substance insoluble in the catalyst, not the catalyst material which comprises the catalyst and other components such as binder. In addition, the original specification at paragraph 69 states that the insoluble substance in the catalyst can be a surface active substance which will prevent particle agglomeration and can be volatilized at a higher temperature and does not disclose that the insoluble substance is in the catalyst material.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-6 and 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to instant claim 1 and its elected dependent claims, the original disclosure does not support the limitation of introducing a substance in the catalyst material, wherein the substance is insoluble in the catalyst material and subsequently removing the insoluble substance from the catalyst material to increase a surface area of the catalyst compared to a surface area of the catalyst in the catalyst material without introducing and removing the substance.

Paragraph 69 at page 18 of the instant original specification states:

[0 0 6 9 ] (1) Temporary introduction of a substance insoluble in the catalyst and removable by subsequent leaching may be used to increase the surface area of the catalyst. Such a substance can be a surface active substance which will prevent particle agglomeration and can be volatilized at a higher temperature. Non-ionic surfactants may be preferable. Metals such as zinc, aluminum, or tin incorporated in the catalyst during preparation can also serve this function.

The use of the term “catalyst” and “catalyst material” appears to mean two different things in the present specification and in the claims. **The Examiner is interpreting the term “catalyst material” to mean a catalyst mixture comprising at least a catalyst and a binder in light of claim 2 and applicant’s specification.** Nowhere in paragraph 69 in the original specification does it state that the insoluble substance is introduced into the catalyst material. Original paragraph 69 states that the insoluble substance is temporarily introduced in the catalyst.

With respect to claim 26, the limitations of “preparing a catalyst material to comprises a catalyst and at least a metal of zinc, aluminum, or tin which is insoluble; and subsequently removing the metal from the catalyst material by leaching to increase a surface area of the catalyst compared to a surface area of the catalyst without removing the metal” are not in the original disclosure for the same reasons given above.

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6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-6 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 26, the limitations of “preparing a catalyst material to comprises a catalyst and at least a metal of zinc, aluminum, or tin which is insoluble; and subsequently removing the metal from the catalyst material by leaching to increase a surface area of the catalyst compared to a surface area of the catalyst without removing the metal” are indefinite because it is unclear how the surface area of the catalyst is increased by leaching the metal from the catalyst material since the catalyst material is a mixture of several components such as catalyst, perfluorovinylether sulfonic acid and polytetrafluoroethylene (see paragraph 14 of the specification and instant claim 2).

Applicant states on page 9 of the remarks that the mixing of zinc, aluminum, and tin in other materials and leaching them out are known in the art. It is unclear to the Examiner how mixing in zinc, aluminum, and tin into a catalyst material comprising a catalyst, a binder, and perfluorovinylether sulfonic acid and subsequently leaching of zinc, aluminum, and tin would create voids in the catalyst since mixing of the metals (zinc, tin, aluminum) into the catalyst material only creates a physical association of the metals with the catalyst and not a chemical one. Since the insoluble substances are not introduced into the catalyst in the catalyst material by mixing, they would not be able to create voids in the catalyst itself after the step of removing

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the insoluble substance contrary to applicant's assertions on page 10 of the remarks filed on 9/12/2005.

Claims 1-6 are also indefinite for the same reason given above for claim 26 because it is unclear how the surface area of a catalyst is increased by removing an insoluble substance from a catalyst material.

### ***Response to Arguments***

8. Applicant's arguments filed 9/12/2005 have been fully considered but they are not persuasive.

Applicant appears to misunderstand that the terms "catalyst material" and "catalyst" are distinct as presently used in the specification and in the instant claims.

The specification discloses increasing the surface area of the catalyst, and does not disclose increasing the surface area of the catalyst material which comprises catalyst, binder, and other components used in a catalyst layer of the fuel cell electrode.

Applicant asserts in the remarks filed on 9/12/2005 that the word "catalyst" in line 22 on page 18 should be "catalyst material" when reading the paragraph as a whole. The Examiner disagrees since as evidenced by instant claim 4, the catalyst comprises platinum and ruthenium. The catalyst is a metal or metal alloy, whereas a catalyst material is a mixture of substances that includes binder, catalyst, and perfluorovinylether sulfonic acid as disclosed and claimed. The Examiner also disagrees with applicant's interpretation of paragraph 69 on page 18 because this interpretation does not appear to make any sense since it is unclear how the insoluble substance

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would be introduced into the catalyst material and selectively be leached to create voids in the catalyst. As admitted by applicant on page 9 of the remarks filed on 9/12/2005, the catalyst material is a mixture of the catalyst and other materials.

Applicant also asserts without providing any evidence on page 9 that specific methods of putting the insoluble substance into the catalyst material and that methods for leaching the metal zinc, aluminum, or tin out of a material, and method of removing non-ionic surfactant by heating at an elevated temperature are known in the art. Applicant asserts that it is well established that a patent need not teach and preferably omits what is well known in the art on page 9 of the remarks. It appears that applicant is admitting on page 9 of the arguments the putting an insoluble substance into the catalyst material and subsequent removable of the insoluble substance from the catalyst material is well known in the art.

However, applicant's assertion is moot because the comparison in the claims is between the surface area of a catalyst with increased surface area by removing the insoluble substance introduced therein and the surface area of a catalyst not having any insoluble substance introduced therein, not between the surface area of a catalyst material which is a mixture of materials that has been treated with the insoluble substance and the surface area of a catalyst material that has not been treated with the insoluble substance. Nevertheless, for reasons stated in the previous Office Action, the original disclosure is not enabled for temporarily introducing an insoluble substance in a catalyst that is already formed in order to compare its increased surface area with a formed catalyst having no insoluble substance temporarily introduced.



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As mentioned above, applicant states on page 9 of the remarks that the mixing of zinc, aluminum, and tin in other materials and leaching them out are known in the art. It is unclear to the Examiner how mixing in zinc, aluminum, and tin into a catalyst material comprising a catalyst, a binder, and perfluorovinylether sulfonic acid and subsequently leaching of zinc, aluminum, and tin would create voids in the catalyst material since mixing of the metals (zinc, tin, aluminum) into the catalyst material only creates a physical association of the metals with the catalyst and not a chemical one. Since the insoluble substances are not introduced into the catalyst in the catalyst material by mixing, they would not be able to create voids in the catalyst itself after the step of removing the insoluble substance contrary to applicant's assertions on page 10 of the remarks filed on 9/12/2005.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster whose telephone number is (571) 272-1293. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (571) 272-1292.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/st

A handwritten signature in cursive script, reading "Susy Tsang-Foster".

**SUSYTSANG-FOSTER  
PRIMARY EXAMINER**